SYMONS'S

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METEOROLOGY AND ART.

"De gustibus non est disputandum."

WE do not often start off with a motto, but in artistic matters differences of opinion are so usual, that we neither request nor expect our readers to agree with the whole of the following article; nor do we for one moment assume that our opinions are correct. But we do assert most positively (1), that our criticisms will be entirely unbiassed as regards the artists, and (2), that our sole object is the promotion of Artistic Meteorology.

We have recently had communications respecting the photographing of clouds, and in *Modern Meteorology* and elsewhere attempts have been made to obtain accurate representations of them. It has occurred to us that amid the thousands of new pictures annually exhibited in London and Paris some good specimens should surely be found. We have therefore gone with some care through the collection in Burlington House, popularly known as the "Academy," and the corresponding exhibition in the Palais des Champs-Elysées, equally popularly known as the "Salon."

As it is courteous to give priority to strangers, and as the French Exhibition was opened a day or two before the English one, we will take the Salon first. Two preliminary remarks may be expedient. There are 7,289 exhibits, and if we deduct 1,000 for sculptures and 289 for engravings, we have 6,000 left, of which very nearly half contain representations of portions of the sky. We need not say that it is beyond our scope to critically consider 3,000 representations of atmospheric conditions.

Another general remark. The Salon indicates the prevalent weather in France during the previous season; snow scenes meet us in all directions.

But to business. We will not give the artists' names, because we are concerned with the accurate representation of the sky, no matter by whom it is attempted.

296 *Charmeuse d'oiseaux.*—Sea and sky of equally intense blue, without a trace of separating line or variation in tint.

484 *Avant l'Orage; soleil couchant en mer.*—Queer sort of sky; the coming storm must have been remarkable.

485 *La neige; Artois.*—Very good leaden, snow-laden sky.
(The same remark applies to the following numbers, which need not be further specified: 1,665, 2,935, 2,948.)

487 *Le soir.*—Sun too pale.

591 *Avant la pluie.—Automne.*—Good blue sky at the top, then rounded cumuli, running into nimbi below.

778 *Un mauvais temps.*—A heavy shower; the rain good, but falling from a cumulus instead of a nimbus.

820 *Messe des morts dans les Morbihan.*—Good strip of cirro-cumulus, but the moon far too faint.

902 *L'orage.*—The only indications of a storm are a little darkness, and an impossible flash of artists' lightning.

917 *Le soir au bord de la mer.*—General effect good, but the sun has set in two or three places.

1210 *Le crépuscule.*—Upper sky very green.

1211 *Souvenir de Loch Carron (Ecosse).*—Grand effect of mist rolling over the mountains.

1338 *Au matin.*—Good rosy sunrise.

1484 *Falaises du Bourg d'Ault.*—Coffee-coloured clouds over a motley blue.

1500 *Caravanne de la Mecque au Caire.*—Fine oriental sky, with very small faint cirro cumuli.

1571 *Village danois* (marked on the frame *L'Hiver en Suède*).—A very queer sky, the centre bright sulphur, surrounded by whitey-brown, and with rose-tinted fragments near the zenith.

1683 *Bords de l'Oise.*—Cirro cumuli arranged in symmetrical ovals round the sun.

1749 *La ville de Vezelay (Yonne).*—Uniform blue sky whitened by vapour, one fragment of fleecy cirrus floating along, and the town on a hill cut sharply against the sky. The shadows of the trees seem to fall in very different directions, but that is not a meteorological point.

1791 *Un potager aux environs de Quillebœuf (Eure).*—Fleecy clouds passing over the moon; but the moon too white, and the garden too dark.

1795 *Retour du chasse; effet de soir.*—We should not like to have been there, for instead of clouds there seem to be large rocks or meteoric masses falling out of the sky.

1889 *Un soir d'orage.*—Edges too regular and round, otherwise good.

2005 *Un jour sombre en Norvége.*—True Norse sky.

2115 *Le "Luisant"; côte de Granville (Manche).*—Nimbi in front of cumuli, but the edges of the cumuli curved the wrong way.

2169 *L'Anse des Kourigans, pres Lorient.*—Fine sea sky.

2333 *Claire de lune; hiver.*—The only indication of moonlight is an orange-coloured round disc, with nothing but nimbus and stratus, and yet a corona.

2377 *Les champs, à Anvers (Oise).*—A little hard, but good cirro-stratus and nimbus.

2924 *Les premières feuilles.*—A leaden sky with a long horizontal crack filled with greenish yellow.

3150 *Fin d'automne; vallée de Chevreuse.*—Good effect of mist and a good stratus, but a stroke of white above which represents (?).

3195 *Pêcheuse de moules, à Berneval; côte Normande.*—A wonderful sky, it looks as if it were made of mother of pearl!

3490 *L'embâcle de la Loire à Villebrenier; fevrier* 1880.—Fine frost tints running from slate to rose on the horizon.

3739 *Soir d'été.*—Good rosy cumulus.

3790 *L'embouchure de l'Escault.*—Too much coffee colour.

3816 *Graziella.*—Green sky.

3930 *Le convent des Arméniens à Venise; effet du soir.*—Good fleecy cirro-cumulus, but sky round setting sun, too brown.

3937 *Isle-les-Villenoy; bords de la Marne.*—The sky blue, white, and grey, like a cheap wall paper.

The Academy Exhibition only contains a total of 1512 exhibits, including architecture and miniatures—say 1300 paintings against the 6000 in the Salon—and it contains few or no such meteorological impossibilities as are to be found in the Champs-Elysées. But we proceed with our notes :—

24 *Cornfield; Towyn N. Wales.*—Sky too white.
38 *Night; Scheveningen.*—Outlines good, but colour too green.
51 *On Borth Beach.*—Magnificent cumuli.
118 *Sunrise from Waterloo Bridge.*—Faint cirri, good but unimportant.
139 *Evangeline.*—Sky nearly as green as the field.
142 *Sister's Kiss.*—Undescribed form of cloud.
208 *Blushing Morn.*—This picture, though "skyed" by the hanging committee, seems to us very truthful.
387 *Britannia's Realm.*—Fine cumuli and a few cirri over an exquisite sea.
427 *The Fen at Sunset.*—The only English picture containing the unnatural coffee colour, of which there are three or four specimens in the Salon.
429 *Buckhaven, Fifeshire.*—Too green.
524 *Exmouth from the Warren.*—Good cumuli and cirri.
535 *King Arthur's Castle, Tintagel.*—Glorious as are often the sky tints in this part of Cornwall, we never saw so green a sky as is here represented.
645 *Vanderdecken.*—Being an imaginary picture, this is perhaps exempt from criticism.
652 *The lingering mists of morning.*—Truthfully rendered.
669 *Sandy shallows of the sea-shore.*—Good cumuli with streams of light through the rifts, but these streams are parallel.
973 *The beachèd margent of the sea.*—Very fine cumuli and cirro cumuli.
994 *The morn in russet mantle clad.*—The contrast between land and sky is too great, the sky too white.
999 "*Make haste to save the hay, for rain will shortly come.*"—We do not think that the labourers need hurry, for the signs of coming rain are not very obvious.

THE METEOROLOGICAL SOCIETY.

The ordinary meeting of this society was held at the Institution of Civil Engineers on Wednesday the 21st ult., Mr. G. J. Symons, F.R.S., President, in the chair. Rev. J. O. Bevan, M.A., F. E. Cobb, E. Filliter, C.E., F.G.S., T. L. Gentles, W. A. Harrison, F.R.G.S., J. W. Peggs, C.E., F. Slade, C.E., and E. J. C. Smith were elected Fellows of the Society.

The discussion on the paper by William Ellis, F.R.A.S., F.M.S., "On the Greenwich Sunshine Records 1876-80," was resumed and concluded; after which a paper was read by G. M. Whipple, B.Sc., F.R.A.S., F.M.S., "On the rate at which Barometric changes traverse the British Isles." The chief results at which the author arrived are as follows :—

1. That the average rate of motion of barometric changes in their progress across the British Isles is about 53 miles per hour.
2. That the mean rate does not vary to any considerable extent from year to year.

3. That the crests travel with somewhat greater velocity than the hollows, hence the character of the movement changes as it passes across the country.
4. That the rate of motion is slightly diminished as the wave passes northward.

A paper was then read by J. W. Zambra, F.M.S., on a new form of Six's self-registering thermometer.

This instrument is an ordinary Six's thermometer, with a tube in continuation of the top bulb; to this tube is attached a reservoir similar in size to the bulb; this reservoir contains mercury, and the continuous tube is made to dip into it, forming a mercury joint. There is also a contrivance to prevent the mercury being forced back into the alcohol; and the reservoir has a small opening to the atmosphere near the top. Thus arranged, the spirit in the thermometer is under the ordinary pressure of the atmosphere, and evaporation is cut off by the intervention of mercury.

These thermometers have been in constant use during the late excessively cold weather and have remained perfect.

It also appears from observation that the column of mercury is more consolidated under this equal pressure, and moves more uniformly, than it does under *confined varying* pressure. In the ordinary instrument the mercury does not always move freely, but hangs in the tube, resulting in the two columns, maximum and minimum, not always indicating exactly the same temperature.

There are various forms in which the improvement can be carried out, all involving the same principle, either of which can be applied to the ordinary Six's thermometers now in use.

THE WEATHER IN APRIL.

April opened with weather much less settled than that which prevailed during the greater part of March, the sky being for the most part cloudy or dull, and heavy showers of rain (and, at some places, hail) fell frequently. The bar. was low over these islands generally, from the 1st to 7th. Temp. was a degree or two above the mean everywhere. Rainfall above average in all districts; particularly so in N.E. and S.W. of England. Bright sunshine was much more continuous in the western than the eastern parts of this kingdom, but nowhere was the sun visible during even half the time that he was above the horizon. The recorded duration varied from 43 hours in the Midland Counties, and 40 hours in Ireland, to 19 hours in N.E. England. Wind was generally S.W. in direction, and moderate in force in E. and S.E. England, but fresh or strong in the west and north.

The weather during the next week was generally cloudy, with frequent, but slight showers. Thunderstorms occurred over central and eastern England on 6th and 7th, and showers of hail fell at many places on both these days.

Atmospheric pressure, which, owing to the passage of numerous depressions across these islands, had been low since the beginning of the month, steadily increased on the 8th and 9th, but on the 10th a fresh decrease began, continuing on the 11th, the area of highest pressure being transferred from over these islands to Scandinavia, while the lowest readings were reported from the south of France. The fall of the bar. continued on the 12th, while it rose in the west and north, and shallow depressions were over the Bay of Biscay and northern Italy.

Temp. was about the mean in Scotland, but below it elsewhere. The

greatest deficit was 5°·2 at Shrewsbury, 5°·1 at Cirencester, and 4°·9 at Oscott (near Birmingham), and the smallest deficit 0°·8 at Barnstaple, and 0°·9 at Donaghadee. Rainfall was rather less than the average everywhere. The maximum duration of bright sunshine during the week (5th–12th) was 48 hours at Dublin and Valentia, and 45 hours in the Isle of Man; the former being 52 per cent. of the "total possible duration," and the latter 48 per cent.

The first day or two of the following week (12th–19th) were very rainy and unsettled, but by the 17th the weather had become fine generally, and continued so, with little exception, to the end of the week. Thunderstorms, accompanied by hail, were experienced over the Channel, except on the 14th, and at Hastings, Dover, and Yarmouth on 15th.

The bar. continued to fall everywhere at the beginning of this week, pressure becoming very uniform. On the 14th a large depression was shewn over the south-east part of Western Europe, which by 8 a.m. on the 15th reached Jersey, and at 6 p.m. of the same day was to the westward of the Scilly Islands. Turning at this point the depression took a northerly course, and occupied the whole of Ireland on the 15th. From the charts of the following day it appeared that the depression had travelled away westwards, but on the 18th a large depression appeared in the west, travelling in a northerly direction. On the same day a small depression was shewn in the neighbourhood of Hamburg.

Temp. about equal to the mean in Scotland and S. and E. England, but slightly below it in all other parts of the kingdom. The maxima were 69° at Cambridge, 67° at London, and 65° at Nottingham and Loughborough. Rainfall more than the average everywhere, with the exception of N.W. England. There was a slight increase in bright sunshine over the greater part of England, but a decided decrease in Scotland and Ireland. The duration ranged from 43 hours at Valentia, and 31 hours at Pembroke, to 17 hours at Dublin, and 15 hours at Cirencester.

Fine and bright weather characterized the next seven days; thunderstorms, however, were experienced at some inland towns in Great Britain, on the 21st and 25th, and very heavy falls of rain were reported from Scotland and Ireland on 21st.

On the 21st a large depression advanced from the Atlantic to our N.W. coasts, and travelled away in a north-eastward direction, immediately succeeded by another of lesser dimensions. The larger was shewn over Norway on 22nd, and the smaller in the vicinity of Aberdeen. When these depressions had moved away, the mercury rose over these islands and their neighbourhood, whilst it fell over S. France and the Baltic; readings becoming highest off our S.W. coasts, and lowest over N. Sweden. Pressure, after changing considerably and irregularly on the 24th, 25th, and 26th, rose generally over W. Europe on the 27th, and an area of high pressure, in which readings exceeded 30·4 in., was developed over N. Ireland, causing rather steep gradients over France and in the Channel. This was followed on the 28th by a fall of the bar. over the whole of these islands and neighbourhood, but the change in the general distribution of pressure was only slight, the area of high pressure being still in the same position. In Scandinavia the mercury rose, and the depression, which had travelled away from our N.W. coasts (above-mentioned) to Norway, apparently moved away eastward. Next day (29th) the bar. rose over the whole of W. Europe, the change being greatest in Scandinavia. The area of highest readings was now shifted to over Scotland, while the low readings were still reported from France. On the 30th, the area of high readings (30·5 in.) lay over Ireland and N. England, the bar. falling in N. Sweden and S.E. France, and rising elsewhere.

Temp. from 19th to 26th was about the mean in E. Scotland, N.E. England, and E. England, but a little below it in all other districts. The maximum (66° at Oxford and Nottingham) was registered on the 20th, and the minimum on the 23rd or 26th. Temp. during the last four days of the month was low for time of year.

Lowestoft. H. E. M.

CLOUD PHOTOGRAPHY.

To the Editor of the Meteorological Magazine.

SIR,—To one who is, on any subject, an enthusiast, there are few things more agreeable than the finding of a greater enthusiast on the same subject. It is accordingly a pleasure to me to find that "a Fellow of the Chemical Society" appears to consider that I have as yet insufficiently insisted on the importance of "the study of the forms and characteristics of clouds" in its bearing on "practical weather wisdom."

To avoid misunderstanding, however, I may be permitted to repeat here the substance of what I have said in "Clouds and Weather Signs," in *Modern Meteorology*, pp. 110—136. It is through the information which the cloud forms give us on the systems of atmospheric currents, their character, distribution, and directions of development, that the study of the clouds is of utility for the prognostication of weather. One who ignores this method of inquiry had better, in my opinion, give up the task of forecasting weather, and cling closely to his umbrella in lieu of it. The rules of "practical weather wisdom," which are not based on the science of winds, may be advantageously left—and they form but a poor bequest—to "the shepherd and the fisherman."

With the principal point in the letter of "a Fellow of the Chemical Society," I, in the main, cordially agree. The panoramic camera will be a useful boon, and even without it photographs of the clouds are a most valuable addition to a meteorological register. Cloud Photography has before it, I believe, an important future. But let us be clear about our object, for it would be easy to obtain a series of photographs of "unusual" cloud forms, which, while interesting from an artistic point of view, might yet prove, meteorologically speaking, worthless.

There are, I think, three directions in which weather science is capable of great development. First in importance of promise is the investigation of anomalies in the great seasonal changes of weather over the most extensive area of the globe available, and of the relations which such anomalies may bear to periodical variations of solar activity; an investigation which may eventually lead to the possibility of predicting the general character of the weather over considerable areas for some months or even years in advance.

Secondly, and in partial connection with the above, a more thorough understanding of the causes which determine the courses of local cyclones and anti-cyclones will eventually lead to a great increase of precision in the prognostication of weather changes of short period and over limited areas.

Thirdly, we may yet more confidently assert that, subsidiary to and supplementary of the work of the meteorologist, there will ever remain the task of the local observer. The latter does and will continue to do a good deal more than supply the raw material for

the meteorologist. Many atmospheric conditions are too complex and subject to variations of too local a character to be completely indicated by any system of weather-charts. In reference to these conditions the study of the forms and movements of the clouds is most important, and to communicate the results of this study, cloud photography will prove highly useful. But it will have to be borne in mind that photographs, to be capable of being thus employed, should show us the most typical cloud-forms, by which I mean the forms indicative of special relations of upper and under currents, of changes of pressure, temperature, and humidity of the atmosphere. Most valuable, in the education of the observer, would be, *e.g.*, a well-selected series of photographs exhibiting the most typical varieties of cloud-forms in the centre, in the front and rear, right and left hand segments of cyclonic and anti-cyclonic systems, travelling in different directions, at different seasons of the year, and over diverse parts of the earth's surface.

The truly exquisite cloud photographs by M. Henri Osti, of Upsala, which Professor Hildebrandsson has given us, both show what has been done, and suggest what has not yet been done, by cloud photography. To the adept at weather-watching a few of these photographs convey a marvellously perfect impression of the weather conditions prevailing at the time and place where they were taken, but only a few of these are, in the strict sense of the word, typical.

Yours truly,

W. CLEMENT LEY.

To the Editor of the Meteorological Magazine.

SIR,—Will you allow me to differ from your correspondent, "A Fellow of the Chemical Society," who says in last month's magazine that "It would be easy to devise a panoramic camera to depict the whole heavens on one plate, &c."

I think the problem alone of constructing a lense capable of performing such a feat as that suggested in the above sentence has yet to be solved.

Steps, however, have been taken towards obtaining photographic records of the forms, height, and motion of clouds, and in 1878 an instrument was devised for the purpose by Professor Stokes, F.R.S., and Mr. F. Galton, F.R.S., which, under the name of photo-nephoscope, has since been experimentally employed at this Observatory.

Capt. Abney, F.R.S., has recently introduced some very important modifications into the instrument, and we hope, as soon as he has completed the preliminary trials now in progress, to continue by its aid the experiments we are carrying out on behalf of the Meteorological Council for the extension of our knowledge of cloud variations.

G. M. WHIPPLE.

Kew Observatory, May, 1880.

THE COMING SUMMER.

To the Editor of the Meteorological Magazine.

SIR,—According to a lunar law of the weather, to which I have frequently called attention,* a wave of unusually great heat should pass over this part of England in the last fortnight or three weeks of June next. July, also, for other reasons, ought to have a high mean temperature. In June there will be a similar occurrence of exceptionally uniform apparent movements of the lunar positions in the heavens to those which happened in August, 1842, the end of July and beginning of August, 1846, May, 1848, June, 1849, July, 1852, June, 1857, June, 1858, July, 1859, July, 1868, July, 1872, and the end of June and July, 1876; in all of which cases very great heat, or remarkably fine, warm, summer weather occurred.

There is, I know full well, a large amount of scepticism concerning the alleged influence of the moon on the weather. *I* was once a very obstinate sceptic on the subject, but, at last, was convinced against my will. Next June will furnish an excellent opportunity for testing the value of my lunar theory. As far as I know, it has always proved correct with regard to summer heat. Allow me, then, to ask your readers, especially the numerous sceptical ones, to carefully watch the weather of next June. If, as I believe, very great heat occurs then, let them candidly and honestly own that there must be something in the theory after all. If, however, contrary to my confident expectations, the heat does not occur, I will readily admit that the theory is not to be depended upon. I only ask for fair play.

Yours, &c.,

GEORGE D. BRUMHAM.

Barnsbury, April 30th, 1880.

* *Met. Mag.*, Vol. III., p. 104.

A DRY PERIOD.

To the Editor of the Meteorological Magazine.

SIR,—I send you a statement of the rainfall here during the past six months, compared with that of previous years, since I began to take an account of it. It seems a remarkable falling off. I don't know if it is general throughout the country, or peculiar to this district.

Rainfall in October, November, December, 1879—January, February, March, 1880	9·83	inches.
Average rainfall for 7 previous years	19·79	,,
Rainfall for October, November, December last ...	4·54	,,
Average for 7 years	12·00	,,
Rainfall for January, February, March last	5·29	,,
Average for 8 years	8·56	,,

The sum of the two last averages differs from the first, owing to the *last* including another year, which happened to be a very wet one.

Yours truly,

S. KING.

Elswick Lodge, Garstang, April 2nd, 1880.

To the Editor of the Meteorological Magazine.

SIR,—The winter and spring rainfall having been exceptionally light, the following record may prove of interest.

The amount given for March includes a heavy fall of snow on the 2nd, amounting to 1·48 in. in the 24 hours. Deducting this, the small total for seven months will be very apparent.

The drought is exceptional for this locality, including, as it does, the usually *very wet* month of October.

1879.	October	1·13 in.
,,	November	1·12 ,,
,,	December	1·75 ,,
1880.	January	·65 ,,
,,	February	1·34 ,,
,,	March.....	2·27 ,,
,,	April	1·27 ,,
	Total for 7 months	9·53 inches.

Diameter of gauge, 5 in.; height above ground, 1 ft. 11 in.; height above sea level, 118½ ft.: situation fairly exposed.—Yours faithfully, ARTHUR R. ANDERSSON.

Breeze Hill, near Liverpool, 3rd May, 1880.

To the Editor of the Meteorological Magazine.

SIR,—I send a table showing the rainfall here during the last six months, and the six months immediately preceding that period. The contrast is rather striking.—Yours faithfully,

H. GEORGE FORDHAM.

Odsey Grange, Royston, 18th April, 1880.

Monthly Rainfall for the Year ending March 31st, 1880.

Summer Half-Year.			Winter Half-Year.		
1879.	April	2·56 in.	1879.	October	·60 in.
,,	May	2·79 ,,	,,	November	·78 ,,
,,	June	4·42 ,,	,,	December	·56 ,,
,,	July	4·34 ,,	1880.	January	·24 ,,
,,	August	4·01 ,,	,,	February	1·70 ,,
,,	September	2·25 ,,	,,	March.....	·70 ,,
	Total.....	20·37 ,,		Total.....	4·58 ,,

To the Editor of the Meteorological Magazine.

SIR,—I noticed in the *Meteorological Magazine* for April the note on the "dry period" by Rev. J. Byng. The rainfall at Lowestoft during the same time was as follows :—

1879	October	1·405 inches.
,,	November	2·130 ,,
,,	December	0·636 ,,
1880	January	0·065 ,,
,,	February...	1·659 ,,
,,	March	0·847 ,,
	Total ...	6·742 inches.

—Yours very truly, HORACE E. MILLER

Belle-Vue Park, Lowestoft, 5th May, 1888.

THIRTY SUMMERS.

To the Editor of the Meteorological Magazine.

SIR,—If you care to publish the enclosed in compliance with Mr. Slade's wish, you can, or forward it to him.—Yours truly,

WM. LUCAS.

Hitchen, 19th March, 1880.

YEAR.	May.	June.	July.	Aug.	Sept.	Oct.	Average of each year.
	°	°	°	°	°	°	°
1849.....	50·6	56·7	59·1	60·0	56·3	48·0	55·1
1850.....	49·9	58·5	61·0	61·0	54·4	46·2	55·2
1851.....	50·3	57·7	58·2	60·5	54·1	50·7	55·2
1852.....	49·6	56·3	64·3	60·3	55·1	45·4	55·2
1853.....	51·0	57·3	60·3	59·0	54·7	49·5	55·3
1854.....	50·6	58·1	60·0	59·2	56·0	47·5	55·2
1855.....	47·3	55·3	61·0	59·3	53·3	49·0	54·2
1856.....	49·2	57·7	60·1	61·0	53·5	50·0	55·2
1857.....	51·5	59·5	62·3	62·7	57·5	51·2	57·5
1858.....	50·3	62·5	58·0	59·5	58·0	49·0	56·2
1859.....	50·0	62·0	65·3	60·5	55·0	49·0	57·0
1860.....	52·5	54·5	57·2	56·7	51·0	48·5	53·4
1861.....	50·6	58·5	60·0	61·0	55·0	52·2	56·2
1862.....	54·9	55·5	57·0	56·0	55·0	49·5	54·6
1863.....	50·7	57·1	59·0	61·0	52·0	49·0	54·8
1864.....	52·9	57·5	60·3	57·4	55·5	48·2	55·3
1865.....	54·5	59·0	62·1	59·4	60·5	47·8	57·2
1866.....	49·6	60·5	59·0	58·5	55·0	49·7	55·4
1867.....	51·9	56·9	58·0	60·5	55·9	47·7	55·1
1868.....	55·5	60·5	64·8	61·9	56·7	45·9	57·5
1869.....	50·5	55·9	63·2	59·1	58·5	49·0	56·0
1870.....	52·0	60·1	63·5	59·0	53·2	47·6	55·9
1871.....	50·5	54·9	60·0	62·1	55·5	47·8	55·1
1872.....	49·5	58·0	63·3	57·8	55·6	45·3	54·9
1873.....	48·8	57·5	61·0	60·5	50·9	45·0	54·0
1874.....	47·9	55·5	61·9	57·8	54·5	48·5	54·3
1875.....	51·4	56·8	55·9	59·3	56·5	45·9	54·3
1876.....	46·1	56·8	61·8	59·1	52·5	49·0	54·2
1877.....	45·9	57·6	57·8	58·1	49·1	44·5	52·2
1878.....	52·8	58·0	60·0	60·9	54·2	47·3	55·5
1879.....	46·5	54·9	56·5	57·0	52·8	46·2	52·3
AVERAGE..	50·6	57·7	60·5	59·6	54·8	48·1	Average of 30 years 55·2

SMALL WHIRLWIND.

To the Editor of the Meteorological Magazine.

SIR,—Referring to Mr. Devas's letter of the 1st inst. in this month's *Meteorological Magazine*, I am told that the whirlwind therein mentioned is common, and is known as "Rogers' Blast."

Yours faithfully,

FRED. COVENTRY.

Ketton Hall, Stamford, April 21st, 1880.

REVIEWS.

The Weather of 1879, *as observed in the neighbourhood of London, and compared in all respects with that of an average year.* By EDWARD MAWLEY, F.M.S. 8vo. Bemrose and Sons, London, 1880.

A VERY useful record of a very exceptional year. Some persons may think that it is a strong statement for the author to make that "the observations taken at my own observatory, which is, perhaps, the best equipped of all the Meteorological Society's stations." We think the statement strictly true; but that being the case, we regret that Mr. Mawley has limited the note upon the "Position of the Instruments, &c.," to half a page; half-a-dozen pages would have been acceptable, including a plan of the grounds, for though few private observers would expend the time and money which Mr. Mawley does upon the perfecting of his observations, still the fully-detailed description of what he has done would be most useful as an almost perfect type, not everywhere to be copied, but to be generally striven after.

The pamphlet is instructive and interesting throughout, and several of the principal elements are given *in extenso* for every day in the year.

There is also a capital diagram giving the monthly values of barometer, thermometer, cloud, humidity, wind, and rain; total mortality, and that due to respiratory and zymotic diseases.

The summary for the year is so true a picture of London experience in 1879 that we cannot refrain from quoting part of the concluding remarks:—

"The year 1879 was colder than any of these 38 years, and, with one exception, the most gloomy. Both January and December, it will be noticed, were extremely cold, while July was extraordinarily dull. It is not, however, the remarkable dulness or coldness of certain months or seasons that calls for special notice here so much as the fact that the whole twelvemonth continued from first to last so persistently sunless and cold. Moreover, it should not be lost sight of that the two months preceding this year, as well as the month immediately following it, were all singularly cold ones.

"Nevertheless, if we leave out of consideration the important elements of temperature and sunshine, the same uniformity will not be found to have been in other respects maintained. In fact, 1879 appears to have shown in several ways a strange partiality for extremes. For instance, the fall of rain during the summer was excessive; but for the three months at the close of the year so slight as to be remarkable. Again, in July there was not a single calm day, whereas in December there was not for weeks together a single windy one. Then again in January the air was exceptionally dry, while in July it was more humid than in the corresponding month of any year since 1843—or for 36 years. The most seasonable and pleasant months were those of September and October, whereas the weather of July proved to be the most abnormal of all.

"If we now turn to the mortality curves on the diagram it will be at once seen that the death-rate in London was unusually high in the Winter and Spring, but remarkably low for the season during the height of Summer. Diseases of the respiratory organs proved very fatal during the earlier months of the year; while in July and August deaths traceable to those of the zymotic class fell much below the average number.

"As regards the influence of the season upon vegetation. Never before had the present generation of agriculturalists experienced so disastrous a year. In most cases the hay-crop was harvested in very bad condition. The wheat approached nearer to a total failure than in any year of our period; other descriptions of corn being also as a rule very late and deficient in yield; while the roots, although usually supposed to delight in moisture, came to no size. To the horticulturist the year was hardly more favourable, the prolonged and severe winter killing all but hardy plants in the flower-garden, and a large proportion of the winter stock of vegetables in the kitchen-garden. The fruit season was, moreover, late, and the crops very poor. In fact, almost the only crop that appeared to rejoice in the frequent and heavy rains, the sunless skies and the low temperatures of last Summer, was the crop of weeds, which true to the proverb concerning them, 'grew apace,' and such was the condition of the ground that it was quite impossible to keep them under."

Climate and Health in South Africa. By J. BONWICK, F.R.G.S. 12mo. S. W. Silver & Co.

To write a perfect manual of climate there are so many qualifications necessary that we doubt if it is possible for one person to possess them all. The author should have had personal experience of the locality to be described, and of others wherewith to compare it; he should be as impartial as a judge; well up in Meteorology, and possess some acquaintance with Botany and Geology. Then he should be sufficiently familiar with medical matters to command the attention of the medical profession; and lastly, he should, without being a mere bookmaker, be at any rate an easy and fluent writer.

The author of the work before us has given a capital collection of extracts, facts and opinions, and we know of no work of equal size giving half the information. The author is evidently not a meteorologist, or he would have prevented the printers constantly printing degrees and tenths of degrees of temperature, as degrees and minutes of arc!

The following account of a dust storm at Griqua Land West may be regarded as a specimen of the lighter portion of this chatty but instructive work —

"On Sunday evening week the Du Toit's Pan, De Beer's, and New Rush camps were maddened by a dust-storm from the north-west, which lasted nearly a couple of hours. We have been asked to write an artistic description of the event; but, as we had to shut ourselves up within our small cabin to prevent ourselves being blown away, and to ballast the cabin itself; and as during the said two hours our eyes, in common with the eyes of all the camps, were blinded with dust, and our ears deafened with the flapping of canvas, and the rush of the wind, and the roar of thunder, description is impossible. All we can say from personal observation and experience is, that the dust was the finest, most searching, the densest, the most pervading, and the most irritating we ever had the good fortune to see, smell, taste, or feel. The dust of the dry diggings is to be classed with plague, pestilence, and famine, and if there is anything worse, with that also. The wind was very wilful, and did a great deal of damage. Half the population in the Fields had to hold on by the poles and ropes like grim death during the time the storm lasted. In some cases holding on was no use."

SUPPLEMENTARY TABLE OF RAINFALL IN APRIL, 1880.

[For the Counties, Latitudes, and Longitudes of most of these Stations, see *Met. Mag.*, Vol. XIV., pp. 10 & 11.]

Div.	STATION.	Total Rain.	Div.	STATION.	Total Rain.
		in.			in.
II.	Dorking, Abinger	1·98	XI.	Corwen, Rhug	...
,,	Margate, Acol	1·17	,,	Port Madoc	2·32
,,	Littlehampton	1·82	,,	Douglas.....	3·05
,,	St. Leonards	2·23	XII.	Carsphairn	5·83
,,	Hailsham	1·69	,,	Melrose, Abbey Gate...	2·59
,,	I. of W., St. Lawrence.	1·76	XIV.	Glasgow, Queen's Park.	3·11
,,	Alton, Ashdell.....	2·15	XV.	Islay, Gruinart School..	2·93
III.	Great Missenden.....	2·80	XVI.	Cupar, Kemback.....	3·10
,,	Winslow, Addington ...	2·03	,,	Aberfeldy H.R.S.	2·61
,,	Oxford, Magdalen Col...	1·89	XVII.	Tomintoul.....	3·86
,,	Northampton	1·23	,,	Keith H.R.S.	2·36
,,	Cambridge, Merton Vil.	1·77	,,	Forres H.R.S.	1·15
IV.	Harlow, Sheering	2·13	XVIII.	Strome Ferry H.R.S....	5·16
,,	Diss	1·55	,,	Auchnasheen H.R.S. ...	...
,,	Swaffham	2·49	,,	Lochbroom	2·36
,,	Hindringham	2·29	,,	Tain, Springfield.....	1·46
V.	Salisbury, Alderbury...	1·90	,,	Loch Shiel, Glenfinnan.	7·77
,,	Calne, Compton Bassett	2·01	,,	Dalwhinnie H.R.S.....	3·84
,,	Beaminster Vicarage ...	2·47	XIX.	Lairg H.R.S.	1·94
,,	Dartmoor, Princetown..	...	,,	Altnabreac H.R.S.	1·50
,,	Langtree Wick	2·00	,,	Watten H.R.S.	1·89
,,	Lynmouth, Glenthorne.	2·41	XX.	Fermoy, Glenville	3·61
,,	St. Austell, Cosgarne...	3·11	,,	Tralee, Castlemorris ...	4·25
,,	Taunton	1·88	,,	Cahir, Tubrid	4·40
VI.	Bristol, Ashleydown ...	1·91	,,	Tipperary, Henry St....	4·11
,,	Ross	1·52	,,	Newcastle West	3·80
,,	Wem, Sansaw Hall.....	1·62	,,	Kilrush	3·40
,,	Cheadle, The Heath Ho.	1·43	,,	Corofin	...
,,	Bickenhill Vicarage ...	1·08	XXI.	Kilkenny, Butler House	2·58
VII.	Melton Mowbray	1·75	,,	Carlow, Browne's Hill..	2·91
,,	Horncastle, Bucknall ...	2·36	,,	Kilsallaghan.....	2·56
VIII.	Walton-on-the-Hill.....	1·27	,,	Navan, Balrath	2·68
,,	Broughton-in-Furness ..	2·74	,,	Athlone, Twyford	4·26
IX.	Wakefield, Stanley Vic.	1·79	,,	Mullingar, Belvedere ...	3·30
,,	Ripon, Mickley	1·99	XXII.	Ballinasloe	3·69
,,	Scarborough.....	2·36	,,	Clifden, Kylemore	7·49
X.	Mickleton.....	3·25	,,	Crossmolina, Enniscoe..	4·99
,,	Haltwhistle, Unthank..	2·82	,,	Carrick-on-Shannon ...	3·53
,,	Shap, Copy Hill	4·02	XXIII.	Dowra	4·05
XI.	Llanfrechfa Grange	2·13	,,	Rockcorry.....	4·22
,,	Llandovery	2·99	,,	Warrenpoint	3·75
,,	Solva	2·57	,,	Newtownards	3·56
,,	Castle Malgwyn	3·01	,,	Carnlough.....	5·58
,,	Rhayader, Nantgwillt..	3·10	,,	Bushmills	2·62
,,	Carno, Tybritle	2·82	,,	Buncrana	2·95

APRIL, 1880.

Div.		STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL. Total Fall.	Difference from average 1860–5	Greatest Fall in 24 hours. Dpth	Date.	Days on which ·01 or more fell.	TEMPERATURE. Max. Deg.	Date.	Min. Deg.	Date.	No. of Nights below 32° In shade.	On grass.
			inches	inches.	in.								
I.	ENGLAND.	Camden Square	2·15	+ 1·02	·73	14	17	67·4	19	34·3	27	...	7
II.		Maidstone (Hunton Court)	1·67	+ ·52	·32	14	14	...	...	...	...	...	...
,,		Strathfield Turgiss	1·63	...	·42	14	13	65·5	19	32·1	26	...	14
III.		Hitchen	1·50	+ ·50	·41	14	18	61·0	20	32·0	7	1	...
,,		Banbury	2·04	+ ·88	·31	14	17	62·3	20	31·0	27	3	...
IV.		Bury St. Edmunds (Culford)	2·37	+ 1·62	·75	25	16	68·0	19	28·0	30	6	10
,,		Norwich (Cossey)	1·88	+ 1·09	·32	6	20	67·0	19	32·0	30	1	4
V.		Bridport	1·97	+ ·49	·52	14	14	...	...	...	...	...	...
,,		Barnstaple	2·62	+ ·61	·59	5	15	...	...	...	...	...	...
,,		Bodmin	2·54	+ ·84	·47	1	14	60·0	3	34·0	30	0	10
VI.		Cirencester	2·21	+ ·92	·41	14	14	...	...	...	...	...	...
,,		Shifnal (Haughton Hall)	1·57	+ ·42	·42	15	17	60·0	19	29·0	30	5	5
,,		Tenbury (Orleton)	2·12	+ ·58	·72	15	20	66·2	25	27·3	30	2	11
VII.		Leicester (Town Museum)	1·57	...	·34	3	21	64·2	19	32·5	30	0	20
,,		Boston	2·49	+ 1·52	·37	14	16	68·0	19	34·0	30	0	...
,,		Grimsby (Killingholme)	1·79	...	·30	6	15	64·0	17	32·0	30	0	...
,,		Mansfield	1·28	...	·39	15	18	64·4	19	26·2	30	1	4
VIII.		Manchester (Ardwick)	1·56	+ ·14	·51	4	17	60·0	3,19	35·0	30	0	...
IX.		York	2·08	+ ·98	·67	3	16	65·0	17*	30·0	30	1	...
,,		Skipton (Arncliffe)	3·12	+ ·08	·47	3	25	...	...	...	...	...	...
X.		North Shields	1·74	+ ·43	·29	6	17	59·0	19†	32·0	30	1	1
,,		Borrowdale (Seathwaite)	9·89	+ 2·99	2·26	21	22	...	...	...	...	..	...
XI.	WALES.	Cardiff	1·98	...	·40	3	13	61·0	25	35·6	26	0	...
,,		Haverfordwest	2·88	+ 1·02	·65	15	17	58·0	19	30·0	30	4	13
,,		Aberdovey	...	...	...[illegible]	..	...	...	...	...	...	...	...
,,		Llandudno	1·24	— ·26	·39	3	12	59·8	19	34·0	14	0	...
XII.	SCOTLAND.	Cargen	3·46	+ 1·62	1·08	18	15	59·4	30	30·0	30	4	...
,,		Hawick (Silverbut Hall)	2·77	...	·65	13	20	...	...	...	...	...	...
XIV.		Douglas Castle (Newmains)	4·59	...	2·10	21	17	...	...	...	...	...	...
XVI.		Loch Long (Arddaroch)	...	...	...	...	...	...	...	...	...	...	...
,,		Kilmory	3·43	...	·51	1	19	...	...	28·0	27	6	...
,,		Mull (Quinish)	4·50	...	·81	3	17	...	...	...	...	...	...
,,		Loch Leven	3·60	+ 2·08	1·30	22	12	...	...	...	...	...	...
XVII.		Arbroath	2·67	+ 1·48	·74	21	14	59·0	20	34·0	30	0	...
,,		Braemar	3·02	+ 1·62	·76	18	20	57·8	30	25·3	12	4	23
XVIII		Aberdeen	3·10	...	1·03	21	20	58·0	20	32·0	29	1	...
,,		Portree	5·16	— ·11	·78	18	19	...	...	...	...	...	...
,,		Inverness (Culloden)	1·05	— ·42	·23	22	...	62·2	17	30·8	9,12	2	16
XIX.		Dunrobin	1·90	+ ·66	·30	24	17	57·5	21	32·0	4,30	2	...
,,		Sandwick	1·72	— ·02	·45	24	18	57·8	20	35·4	26	0	2
XX.	IRELAND.	Cork	...	...	...	...	...	...	...	...	...	...	...
,,		Darrynane Abbey	...	...	...	...	...	...	...	...	...	...	...
,,		Waterford	3·36	+ 1·13	·59	15	15	61·0	2	35·0	14‡	0	...
,,		Killaloe	4·41	+ 2·28	·69	21	19	68·0	30	32·0	12	1	...
XXI.		Portarlington	2·98	+ ·96	·54	15	22	58·0	19	32·0	27	2	...
,,		Monkstown	1·78	+ ·14	·69	15	16	...	...	...	...	...	...
XXII.		Galway	3·60	...	·81	20	19	60·0	29	34·0	27	0	...
XXIII		Waringstown	4·02	...	1·23	21	19	62·0	19	31·0	8§	5	7
,,		Londonderry	3·74	...	·50	5	22	63·8	30	35·0	9,27	0	9
,,		Edenfel (Omagh)	3·41	...	·56	21	24	65·0	28	28·0	29	9	...

* And 19. † And 20. ‡ And 27, 30. § And 11, 26, 29.

\+ Shows that the fall was above the average; — that it was below it.

METEOROLOGICAL NOTES ON APRIL.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; T S for Thunderstorm; R for Rain; H for Hail; S for Snow.

ENGLAND.

STRATHFIELD TURGISS.—A fine yet showery April, following a dry March, revived our agricultural expectations. So far all has gone well; wheat crop very promising; wild cherry in flower on 1st, dog violet on 3rd, pear on 5th; first goslings seen on 5th; blackthorn in flower on 8th; elm in leaf on 9th; cuckoo first heard on 15th, nightingale on 18th, wryneck on 19th, first swallow seen on 20th; oak in leaf on 21st, wild strawberry in flower on 22nd.

BANBURY.—TS with soft H on afternoon of 8th; H on 2nd and 26th; high wind on 27th, 28th, and 29th. Blackthorn in flower on 17th.

CULFORD.—A month of very favourable weather, without great depressions of temp. likely to prove injurious to crops of any kind. Mean temp., 47°·4. Nightingale first heard on 18th, and swallows first seen on 19th. About the 25th the weather became colder, and the song of the nightingale was discontinued for several days; the cuckoo was not heard till the 30th. T on 7th and 22nd; H on 5th, 6th, and 26th; windy on 21st.

COSSEY.—Sand martins arrived on 18th, and swallows on 23rd.

BODMIN.—Mean temp. of month 49°·4. The nights were intensely cold from the 22nd to the end of the month, and on the morning of the 30th the grass min. fell to 24°.

CIRENCESTER.—The early part of the month was mild with S.W. and W. winds; towards the end it was rather cold with N.E. and E. winds. Rainfall moderate.

SHIFNAL.—As genuine an April as it had been a true March. Showers and sunshine, with westerly winds and growing weather till the 8th, when it suddenly turned cold with N. and N.E. winds, and remained so till the 16th, then pleasant again, with S. and S.W. winds and low bar., till 24th. The remainder of the month was cold and ungenial, with rising bar., and terminated with a sharp frost and ice as thick as a penny on 30th. TS on 6th. Young rooks seen on 9th, sand martins arrived on 12th, wild cherry in bloom and first swallow seen on 19th, willow-wren seen on 24th, cuckoo heard on 26th, damson trees in full bloom on 27th.

ORLETON.—The weather was generally cloudy, with strong winds, chiefly from N. and E., and frequent light falls of R, but not amounting to the average quantity; there were a few bright days. The temp. was about 1½° below the average, but the fluctuations were small, and there were few frosty nights. Early plum trees were in blossom about the 20th, and cherry trees about the 23rd, Swallows were seen on the 21st, and the chiff-chaff on the 24th. The cuckoo was heard on the 23rd; T was heard on the 6th, 7th, 13th and 22nd. A very favourable month for farm work.

LEICESTER.—T heard on afternoons of 5th and 6th; lunar halo on 19th.

BOSTON.—The temp. of the month is slightly below the average, but the changes were very great, some days being bright with warm sunshine and a mean temp. of 56°, and others, cold and dull with cutting N.E. winds. Two TSS at the beginning of the month. Cuckoo first heard on 25th. The total rainfall from the beginning of autumn to the end of this month is more than 23 in. below the average of 20 years.

KILLINGHOLME.—Swallows seen on 24th; cuckoo heard on 30th.

MANCHESTER.—A fine spring month, with moderate temp. and genial showers in the early part of it. Vegetation has progressed slowly, being retarded by the cool nights; but general appearances are promising.

YORK.—TSS on 5th and 7th; H on 6th, 25th, and 26th.

NORTH SHIELDS.—TS with H and R on 22nd, and T on 5 days. Aurora on 8th and 14th.

SEATHWAITE.—No spring weather during the month; cold N.W. winds at the beginning; and cold E. winds in the middle; frosts at night at the end.

WALES.

HAVERFORDWEST.—Showery weather during the first week, then much colder, with night frosts till the 13th, when a very wet period set in; the R was cold and the weather ungenial; at times it blew very hard. From the 20th to the 22nd was very stormy, the wind rising to a full gale; from the 23rd to the 30th the weather was most ungenial, bright sunshine, bitter winds, air very dry, and sharp frosts at night; nearly as bad as April, 1879. T and L on 15th; T heard on several days. Wind blew from E., N.E. and S.E. on fifteen days, W. and N.W. on twelve days, and only three days from S.W. and S.

LLANDUDNO.—A fine spring month, rainfall and mean temp. both below the average, the former to the extent of about half-an-inch, and the latter by about a degree and a half. No frost and a great amount of sunshine. S on distant hills on 26th.

SCOTLAND.

HAWICK.—East winds prevailed throughout the month; gales on the 20th and 21st; T heard on 22nd; hills white with S on the 25th.

QUINISH.—A showery, unsettled month; rather cold from 1st to 19th. Vegetation and foliage very far advanced. Strong gale from S. on 18th.

BRAEMAR.—A month of cold easterly winds.

ABERDEEN.—During the first part of the month northerly to north-westerly winds prevailed, and from the 11th till the close easterly, varying from N.N.E. to S.S.E., with passing showers of cold rain. Rainfall about the average.

PORTREE.—A cold month; from 4th to 6th squally, and from 15th to 24th squally, with H and sleet showers; fresh S on hills from 15th to end of month. Pasture grass much behind the usual condition at this time of year.

CULLODEN.—Month generally fine; out-door labour advanced, cereals got down in good condition; pastures well forward by the close of the month. Forest trees early in leaf.

SANDWICK.—The weather was very favourable for agricultural operations. S.E. winds prevailed in the early part of the month and N.W. in the latter part. Rainfall rather less than the mean of the previous 39 years. Primroses were in flower on 12th and gooseberries and currants on 17th. Aurora on 29th.

IRELAND.

WATERFORD.—Wind very high in night of 17th and all day on 18th. T S on 4th; H on 4th, 5th, and 6th. Lunar corona on 20th.

KILLALOE.—Almost continuous rain for the first three weeks, with very severe S.E. gales from 18th to 20th; latter days of month very fine, with low temp., until 30th, when the max. in shade registered 68°.

WARINGSTOWN.—Very fine and seasonable, in spite of considerable rainfall; farming operations forward.

LONDONDERRY.—On the whole the wettest month we have had for some time; wind principally N.E. and S.W.